SMALL PETRIFIED SEEDS FROM THE PENNSYLVANIAN OF ILLINOIS

BY

FLORENCE ELIZABETH NEELY

A.B., State University of Iowa, 1942
M.S., State University of Iowa, 1944

AN ABSTRACT OF A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN BOTANY
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UNIVERSITY OF ILLINOIS, 1951

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SMALL PETRIFIED SEEDS FROM THE PENNSYLVANIAN OF ILLINOIS

Although the larger petrified seeds of the Trigonocarpales are usually better preserved and more easily studied than the smaller forms of the Cardiocarpales and the Lagenostomales, well-preserved, small petrified seeds have been found in coal balls which were collected at the New Delta locality in Williamson County and at the Berryville locality in Lawrence County, Illinois. The nitrocellulose peel method was used in the preparation of serial sections of these seeds. The anatomy of the new specimens indicates the occurrence of at least two new species of small petrified seeds, *Taxospermum undulatum* in the Cardiocarpales and *Coronostoma quadrivasatum* in the Lagenostomales. Moreover, it is possible to clarify the description of *Conostoma quadratum* Graham, a species which had previously been described from Illinois.

Taxospermum undulatum sp.nov.

Over forty specimens of these small seeds were found in coal balls associated with the No. 6 coal at the top of the Carbondale group in the Pennsylvanian system at the New Delta locality in Williamson County.

Diagnosis. Ovoid seeds 4.5 mm. × 3.5 mm.; lateral flattening slight; two vascular strands depart obliquely upward from the chalazal tracheal disc, penetrate the sclerotesta and rise at the outer margin of the sclerotestal ribs to the vascular cushions on either side of the micropyle; female gametophyte, when present, distally differentiated into a low tent-pole which is flanked by two spherical to elliptical archegonia; periphery of the sarcotesta irregularly undulating.

Coronostoma quadrivasatum gen. et sp.nov.

Three specimens of this new seed have been discovered in coal balls from the upper part of the McLeansboro group of

the Pennsylvanian system at the Berryville locality in Lawrence County.

Diagnosis. Elliptical seeds 4.5 mm. in length × 3.25 mm. in maximum diameter; slight external ridges of the fused apical lobes, while the lower seed is round in transverse section; four unbranched vascular strands ascend in the inner zone of the integument from a basal vascular bundle; nucellus and integument confluent up to the level of the plinth; conical plinth surmounted by a thickened, tubular lagenostome which terminates within the upper micropyle.

Conostoma quadratum Graham

A single, well-preserved specimen of this seed was found in coal-ball material collected in the Berryville locality of the Upper McLeansboro group in the Pennsylvanian system of Illinois.

After comparison with the slides prepared from the type specimen of *C. quadratum*, this new specimen of *Conostoma* has been found to correspond so closely in several details of vascularization and organization of the integument that it has been assigned to the same species. The original description of *C. quadratum* was based upon a series of transverse peels which were made from the lower portion of a single seed. This incomplete specimen did not include the region of the lagenostome.

The new specimen of *C. quadratum* has a maximum diameter of 1.13 mm., and the maximum length of any of the sections is 3.9 mm. The elliptical seed is characterized by the extension of the integument into four large, apical cusps and the same number of basal keels. The sculptured, ellipsoidal lagenostome is inserted in the depressed apex of the dome of the plinth, below the lower opening of the micropyle. The new specimen of *C. quadratum* supplements the original description of this species by furnishing information concerning the lagenostome and the general aspect of the longitudinal section of the seed.

The plants of the American Paleozoic have been considered to represent a westward extension of the European flora. The anatomy of the three small seeds, *Conostoma quadratum*, *Coronostoma quadrivasatum* and *Taxospermum undulatum*, gives new emphasis to this similarity between the American and European coal floras.

VITA

Florence Elizabeth Neely was born on September 13, 1920, in Bushnell, Illinois. After graduating from the Iowa Falls High School in 1938, she attended Ellsworth Junior College and later the State University of Iowa to receive the A.B. degree in general science in 1942. She continued at the State University of Iowa, serving as a graduate assistant, and received the M.S. degree in botany in 1944. For three years she was an instructor at Salem College, and then for one year she taught at Grays Harbor College. During the academic years from 1948 to 1950 she held a graduate assistantship in botany at the University of Illinois, and in 1950-51 she was appointed to a Graduate College fellowship.

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